DOCUMENT RESUME

ED 027 709 EF 002 610

Suggested Ordinance and Regulations Covering Public Swimming Pools.
American Public Health Association, Inc., New York, N.Y.
Pub Date 64
Note-37p.
EDRS Price MF-$0.25 HC-$1.95
Descriptors-Construction Needs, *Design Needs, Guidelines, Infectious Diseases, *Legislation, Maintenance, Public Health, *Recreational Facilities, Safety, *Standards, *Swimming Pools

In preparing this publication, the Joint Committee on Swimming Pools and Bathing Places intended to promote the proper installation of public swimming pool facilities and their efficient operation. Objectives were--(1) to be concerned with the development of realistic and reasonable minimum standards to safeguard the health and safety of swimmers and bathers, (2) to develop standards that had some degree of flexibility, and (3) to produce a legal instrument that could be used as a guide by government in exacting minimum swimming pool standards. This ordinance and these regulations, if enacted, should serve to minimize the spread of infections, reduce injuries through elimination of hazards, and promote public swimming pools as attractive and safe places for enjoyment, recreation, and physical fitness. While this report is in the form of suggested legislation, it is also a guide and may be used in the evaluation of the design, construction, operation and maintenance of public swimming pools. (RK)

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Suggested Ordinance and Regulations Covering Public Swimming Pools

EF002610

The American Public Health Association

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Suggested Ordinance and Regulations Covering Public Swimming Pools

Prepared by the Joint Committee on Swimming Pools
in cooperation with
the United States Public Health Service

Approved by the Conference of State Sanitary Engineers, Conference of Municipal Public Health Engineers and the Engineering and Sanitation Section, the Committee On Evaluation and Standards and the Governing Council of the American Public Health Association

1964

Published by

AMERICAN PUBLIC HEALTH ASSOCIATION
1790 Broadway, New York 19, N. Y.

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Foreword

This publication is a departure from the style of the previous reports of the Joint Committee on Swimming Pools and Bathing Places. The ten previous reports issued in 1926, 1927, 1929, 1932, 1935, 1937, 1940, 1942, 1948, and 1957, were written in narrative style and represented group thinking of responsible individuals actively engaged in the design, operation, and administrative aspects of swimming pool and bathing place sanitation. Suggested standards for the design, equipment and operation of swimming pools and bathing places were included in the text, but were not in a form to be included easily in legislation for the protection of the public health and welfare.

During the past decade there has been a tremendous upsurge in construction of public swimming pools and pools in clubs, motels, and private residences which has placed new emphasis upon the need for control of sanitation and safety. Further, there has been an identified need for uniformity of the legislation that was being enacted by some progressive governmental jurisdictions to establish legal standards for the design, installation and operation of swimming pools.

In 1959, the Joint Committee on Swimming Pools and Bathing Places decided not to use the narrative report form but concentrate upon the development of three model codes: one concerning public swimming pools, another covering private residential–type pools, and a third involving natural bathing areas. This report is the first of the three model codes. While it took four years to develop this document, it is expected that the other two will follow at short intervals.

It has been the avowed purpose of the Joint Committee to prepare a publication, the purpose of which is promotion of proper installation of public swimming pool facilities and their efficient operation. This ordinance and these regulations, if enacted by a governmental jurisdiction, should serve to minimize the spread of infections, to reduce injuries through elimination of hazards, and to promote public swimming pools as attractive and safe places for enjoyment, recreation, and physical fitness.

CLARENCE W. KLASSEN, P.E.

Introduction

The Joint Committee on Swimming Pools and Bathing Places, since the formation of its parent organization, the Committee on Swimming Pools of the Sanitary Engineering Section, American Public Health Association, in December 1918, has been concerned with minimum standards for design, operation and maintenance of swimming pools and bathing areas to minimize transmission of disease and occurrence of accidents. For many years the Committee felt that it could best serve the needs of the public and the swimming pool and allied industries by reviewing data concerning swimming pools and bathing areas, interpreting them when necessary, and suggesting design and operation criteria. The formulation of legal standards was left to appropriate agencies largely state departments of health. Over the years, chief sanitary engineers of all of the states have submitted comments, suggestions and criticisms of the recommendations of the Joint Committee.

In recent years, there have been an increasing number of requests for the Joint Committee to develop prototype legislation applicable for use by both state and local governments establishing minimum standards for swimming pools. Some health agencies indicated that they did not have the resources readily available to evaluate some of the newer designs of swimming pools and the equipment being developed. Other agencies and the swimming pool industry requested more uniformity of minimum requirements. The Joint Committee undertook the development of the Suggested Ordinance and Regulations Covering Public Swimming Pools with several definite objectives.

First of all, the Committee was concerned with the development of realistic and reasonable minimum standards to safeguard the health and safety of swimmers and bathers. Some criteria can be demonstrated as being required on a "cause-and-effect" relationship. However, most of the provisions are those which many experts in public health and industry have accepted as reasonable requirements. They are goals which are practical and attainable. Further, these standards have not been found lacking in the past when analyzing the occurrence of disease or injury from the use of these facilities.

Secondly, the Joint Committee desired to develop standards that had some degree of flexibility. Members of the Committee did not wish to propose a rigid specification code which would freeze development. Therefore, this document is in two parts; the ordinance section and the regulations section. The suggested ordinance establishes the overall principle of governmental control of the design, construction, operation and maintenance of public swimming pools, general performance standards and a frame of reference for the enactment and enforcement of suggested regulations. The Committee was aware that frequently it is a slow and laborious task to amend an ordinance once enacted, and has not included within the provisions of the ordinance specifications that may be subject to change with increasing knowledge and scientific progress. It is anticipated that within five years some present minimum requirements should be changed as research on various aspects of the design, construction, operation, and maintenance of public swimming pools provide additional data. Since amendments to regulations are easier to adopt than amendments to ordinances, specific performance criteria have been relegated to the regulations section.

The third objective of the Joint Committee in drafting this publication was to produce a legal instrument that could be used as a *guide* by government in enacting minimum swimming pool standards. The basic provisions which are proposed in the ordinance and regulations are the collective judgment of many persons who participated in reviewing the Joint Committee's drafts. There is no complete unanimity on some requirements. The Committee has attempted to provide some latitude. In a manner this document may be considered suggested framework. Some governmental agencies may wish to make some sections more stringent and others less restrictive. We believe that we have produced a document that permits this freedom.

And lastly, while the terminology of the ordinance and code suggests the health officer as being the enforcing and responsible official, the Joint Committee did not and does not want to propose any infringement of the powers and duties of other officials who have or may have legal responsibilities to control some aspect of the design, construction, operation and maintenance of swimming pools. While care has been taken to reduce possible infringement

of powers and duties of other officials, the Joint Committee cautions against adopting the ordinance and regulations as proposed without carefully scrutinizing the document for conflict and duplication of existing legislation.

While this report of the Joint Committee on Swimming Pools and Bathing Places is in the form of suggested legislation, it is more than just a legal document. It is a guide to be used in the evaluation of the design, construction, operation and maintenance of public swimming pools. There are three basic legal principles underlying good administrative law:

1) Laws should be something to guide and help people, and to establish a trend of acceptance. They should not be considered exclusively as restrictive or punitive.

2) Laws must be reasonable.

3) Laws must be enforced and obeyed.

In accordance with the first principle, the Committee has tried to establish guidelines for what it considers good swimming pool sanitation.

It is hoped that this document will prove to be useful. The Joint Committee has recognized the need for uniform legislation of the design, construction, operation and maintenance of public swimming pools with principal focus upon the public health and safety requirements. State and local governments who desire to enact minimum standards for public swimming pools may find this *Suggested Ordinance and Regulations Covering Public Swimming Pools* a useful resource.

Eric W. Mood, M.P.H.

SUGGESTED ORDINANCE

AN ORDINANCE regulating the design, construction, operation, and maintenance of public swimming pools including all necessary appurtenances, providing for the adoption and enforcement of regulations, thereto:

BE IT ORDAINED by the.....of

.....as follows:

Title and Scope

1.1 *Title*—This ordinance shall be known as the "Public Swimming Pool Ordinance," may be so cited, and will be referred to as this Ordinance.

1.2 *Scope*—The provisions of this Ordinance shall apply to all public swimming pools as hereinafter defined including all facilities incident thereto. The purpose of the Ordinance shall be to provide a guide for the design, construction, operation, and maintenance of such pools so that health and safety hazards will be minimized.

Definitions

The following definitions shall apply in the interpretation and enforcement of this Ordinance. The word "shall" as used herein indicates a mandatory requirement.

2.1 *Swimming Pool*—Any structure, basin, chamber, or tank containing an artificial body of water for swimming, diving, or recreational bathing and having a depth of two feet or more at any point.

2.2 *Public Swimming Pool*—Any swimming pool, other than a private residential swimming pool, intended to be used collectively by numbers of persons for swimming or bathing operated by any person as defined herein, whether he be owner, lessee, operator, licensee, or concessionaire, regardless of whether a fee is charged for such use.

2.3 *Private Residential Swimming Pool*—Any swimming pool, located on private property under the control of the home-

owner, the use of which is limited to swimming or bathing by members of his family or their invited guests. (The design, construction, and operation of such pools are not subject to the provisions of this Ordinance.)

2.4 *Person*—Any person, firm, partnership, association, corporation, company, governmental agency, club, or organization of any kind.

2.5 *Health Department*—Is the Health Department of the City, County, or State of.....

Submission of Plans and Specifications

3.1 No person shall begin construction of a public swimming pool or shall substantially alter or reconstruct any public swimming pool without first having submitted plans and specifications to the Health Department for review and approval. The plans shall be prepared by an architect or engineer licensed to practice in the State of..... All plans and specifications shall be submitted in duplicate (or additional copies as established by the Health Officer), and the Health Department shall arrange for the review and approval of the plans and specifications by other appropriate departments concerned with such matters as zoning, electrical, structural, and plumbing requirements. No permit to construct, alter, or renovate shall be issued by the Health Department until approval is granted by the other departments involved.

3.2 The application for permit to construct or remodel a public swimming pool shall be on such forms as may be prescribed by the Health Department, together with any supporting data as may be required for the proper review of the plans.

3.3 The pool and facilities shall be built in accordance with the plans as approved unless approval of changes has been given in writing by the Health Officer. The owner or his agent shall notify the Health Officer at specific predetermined stages of construction and at the time of completion of the pool to permit adequate inspection of the pool and related equipment during and after construction. The pool shall not me placed in operation until such inspections show

compliance with the requirements of this Ordinance.

3.4 The criteria to be followed by the Health Department in the review and approval of plans shall be promulgated as Rules and Regulations as authorized by this Ordinance.

3.5 The plans shall be drawn to scale and accompanied by proper specifications so as to permit a comprehensive engineering review of the plans including the piping and hydraulic details and shall include:

(a) Plan and sectional views with all necessary dimensions of both the pool and surrounding area.

(b) A piping diagram showing all appurtenances including treatment facilities in sufficient detail, as well as pertinent elevation data, to permit a hydraulic analysis of the system.

(c) The specifications shall contain details on all treatment equipment, including catalog identification of pumps, chlorinators, chemical feeders, filters, strainers, interceptors, and related equipment.

Design, Construction, and Operation Features

4.1 Reasonable regulations shall be promulgated by the Health Department covering design, construction, and operation of public swimming pools. No permit to construct, alter, remodel, or license to operate shall be granted unless the pool conforms with these Regulations.

The Regulations shall cover but not be limited to the following items:

(a) Water supply, sewer and waste connections.
(b) Design detail.
(c) Materials of construction.
(d) Walls, markings, and slopes.
(e) Overflow gutters, and skimmers.
(f) Inlets and outlets.
(g) Separation, zoning, and control of users.
(h) Recirculation equipment, piping, and appurtenances.
(i) Disinfection and chemical feed equipment.
(j) Bathhouse, and appurtenances including plumbing fixtures.

(k) Ladders, stairs, decks and walkways, diving equipment.
(l) Diving, swimming, and bathing areas.
(m) Ventilation, lighting, and electrical facilities and connections (safety aspects).
(n) Safety and lifesaving equipment.
(o) Water quality, supervision, and cleaning.
(p) Operation.

Permits to Operate

5.1 No person as defined in Section 2.3 shall operate or maintain a public swimming pool unless he has obtained a permit to operate such pool from the Health Department. Such permits shall be obtained by..... (insert date) and shall be valid for one year unless otherwise revoked for cause. Only persons who comply with this Ordinance shall be entitled to receive and retain such a permit. Such permits are not transferrable.

5.2 The Health Department is authorized to promulgate Regulations and establish fees to cover inspections and other services in connection with the operation and maintenance of public swimming pools for the protection and promotion of public health and safety. The Health Department shall perform inspections at reasonable hours to insure compliance.

Revocation of Permits

6.1 The Health Department may revoke any permit for failure to comply with the duly promulgated Regulations referred to in this Ordinance or in cases where the permit has been obtained through non-disclosure, misrepresentation, or misstatement of a material fact.

6.2 Before a permit is revoked, the person to whom the permit has been issued shall have notice in writing enumerating instances of failure to comply with the Regulations. He shall be given an opportunity for appeal to the Health Department, and failing, may appeal to the..... of the....., regarding the reasonableness of the revocation of permit.

6.3 The permit shall be reissued upon proper application and upon presentation of evidence that the deficiencies causing revocation have been corrected.

Health and Safety

7.1 No person having a communicable disease shall be employed or work at a public swimming pool. All patrons or swimmers suspected of having an infectious disease shall be excluded.

7.2 Appropriate facilities shall be provided for the safety of bathers as may be required by the Health Department. This shall include lifesaving equipment, safety devices, lifebuoys, lifehooks, first-aid kits, telephone, with adequate staff during swimming periods who are competent in lifesaving and artificial resuscitation. Competent lifeguards shall be on duty during all swimming periods when so ordered by the Health Officer or when a use fee is charged.

7.3 Every swimming pool shall be under the supervision of a capable individual who shall assume the responsibility for compliance with all parts of this Ordinance relating to pool operation and maintenance, and safety of bathers.

7.4 When the swimming pool is not open for use, access to the pool shall be prevented.

7.5 Instruction regarding emergency calls shall be prominently posted.

7.6 Not more than the maximum design bather load shall be permitted in the swimming pool at any one time.

Inspection

8.1 The Health Department is authorized to conduct such inspections as it deems necessary to insure compliance with all provisions of this Ordinance and shall have right of entry at any reasonable hour to the swimming pool for this purpose.

Operation

9.1 The operator of each pool shall keep a daily record of information regarding operation including disinfectant resi-

duals, pH, maintenance procedures, recirculation, together with other data as may be required on forms furnished by the Health Department. These data shall be kept on file by the operator for six months for review by the Health Department or submitted periodically to the Health Department as may be required by the Health Officer.

9.2 The pumps, filter, disinfectant and chemical feeders, and related appurtenances shall be kept in operation at all times the swimming pool is in use and for such additional periods as needed to keep the pool water clear and of satisfactory bacterial quality. Continuous operation of the recirculation system shall be maintained in swimming pools having a capacity of 200,000 gallons or more during seasons of regular use.

Fees for Permits

10.1 The fee for a permit to conduct, operate, and maintain a public swimming pool shall be $..... per year.

Unconstitutionality Clauses

11.1 Should any section, paragraph, sentence, clause, or phrase of this Ordinance be declared unconstitutional or invalid for any reason, the remainder of said Ordinance shall not be affected thereby.

Repeal and Date of Effect

12.1 All ordinances and parts of ordinances in conflict with this Ordinance are hereby repealed and this Ordinance shall be in full force and effect immediately upon its adoption and publication as provided by law.

Penalty Clauses

13.1 Any person who violates any provision of this ordinance shall be fined not more than ..... at the discretion of the court having jurisdiction. Each and every violation of the provisions of this Ordinance shall constitute a separate offense.

REGULATIONS ON THE DESIGN, CONSTRUCTION, AND OPERATION OF PUBLIC SWIMMING POOLS

These Regulations are promulgated under the authority granted to the Health Department of..... under the provision of the Ordinance regulating design, construction, and operation of public swimming pools. They have the force of law as authorized by said Ordinance and take effect immediately on publication.

Water Supply

1.1 The water supply serving the swimming pool and all plumbing fixtures including drinking fountains, lavatories, and showers, shall meet the requirements of the Health Department for potable water.

1.2 All portions of the water distribution system serving the swimming pool and auxiliary facilities shall be protected against backflow. Water introduced into the pool, either directly or to the recirculation system, shall be supplied through an air gap (American Standards Association A40.4-1942). When such connections are not possible, the supply shall be protected by a suitable backflow preventer (American Standards Association A40.6-1943) installed on the discharge side of the last control valve to the fixture, device, or appurtenance.

Sewer System

2.1 The sewer system shall be adequate to serve the facility, including bathhouse, locker room, and related accommodations.

2.2 There shall be no direct physical connection between the sewer system and any drain from the swimming pool or recirculation system. Any swimming pool or gutter drain or overflow from the recirculation system when discharged to the sewer system, storm drain or other approved natural drainage course shall connect through a suitable air gap so

as to preclude possibility of backup of sewage or waste into the swimming pool piping system.

2.3 The sanitary sewer serving the swimming pool and auxiliary facilities shall discharge to the public sewer system wherever possible. Where no such sewer is available, the connection shall be made to a suitable disposal plant designed, constructed, and operated in accordance with the requirements of the Health Department.

Swimming Pool Construction Materials

3.1 Swimming pools and all appurtenances thereto shall be constructed of materials which are inert, non-toxic to man, impervious, permanent, and enduring; which can withstand the design stresses; which will provide a tight tank with a smooth and easily cleaned surface, or to which a smooth, easily cleaned surface finish can be applied, and which may be finished in white or light color.

3.2 All corners formed by intersection of walls and floors shall be rounded.

3.3 Sand or earth bottoms are not permitted in swimming pool construction.

3.4 Swimming pool finish, including bottom and sides, must be of white or light colored material, non-toxic to man, with a smooth finished surface without cracks or joints bonded to the supporting members, excluding structural expansion joints.

Design Detail and Structural Stability

4.1 All swimming pools shall be designed and constructed to withstand all anticipated loadings for both full and empty conditions. A hydrostatic relief valve shall be provided in areas having a high water table. The designing architect or engineer shall be responsible for certifying to the structural stability and safety of the pool.

4.2 No limits are specified for length and width of swimming pools, except that swimming pools used for competition should meet required dimensions, and the requirements for diving areas as outlined on page 27 shall be observed. Con-

sideration shall be given to shape from the standpoint of safety and the need to facilitate supervision of bathers using the pool.

4.3 Provisions shall be made for complete, continuous circulation of water through all parts of the swimming pool. All swimming pools shall have a recirculation system with necessary treatment and filtration equipment as required in these standards.

4.4 The shape of any swimming pool shall be such that the circulation of pool water and control of swimmers' safety are not impaired.

4.5 The minimum depth of water in the swimming pool shall be three feet except for special purpose swimming pools or for restricted or recessed areas in general swimming pools which are set aside primarily for the use of children. Such areas when included as part of the swimming pool shall be separated from the swimming pool proper by means of a safety line supported by buoys and attached to the side walls. Wadding facilities for children, physically separated from the swimming pool, are preferred. Such facilities may be served by the swimming pool recirculation system with turnover rates of once every two hours.

4.6 The maximum depth at the shallow end of the swimming pool shall not exceed three feet six inches except for competitive or special purpose swimming pools.

Depth Markings and Lines

5.1 Depth of water shall be plainly marked at or above the water surface on the vertical wall of the swimming pool and on the edge of the deck or walk next to the swimming pool, at maximum and minimum points and at the points of break between the deep and shallow portions and at intermediate one-foot increments of depth, spaced at not more than 25-feet intervals measured peripherally. The depth in the diving areas will be appropriately marked.

5.2 Depth markers shall be in numerals of four inches minimum height and a color contrasting with background. Where depth markers cannot be placed on the vertical walls above

the water level, other means shall be used, said markings to be plainly visible to persons in the swimming pool.

5.3 Lane lines or other markings on the bottom of the swimming pool shall be a minimum of ten inches in width and be of a contrasting color.

Inlets and Outlets

6.1 All swimming pools shall be provided with an outlet at the deepest point to permit the pool to be completely and easily emptied. Openings must be covered by a proper grating which is not readily removable by bathers. Outlet openings of the grating in the floor of the pool shall be at least four times the area of discharge pipe or provide sufficient area so the maximum velocity of the water passing the grate will not exceed 1½ feet per second. The minimum width of grate openings shall be one-half inch, and the maximum not over one inch.

6.2 In swimming pools with deep water at or near one end, multiple outlets shall be provided where the width of the pool is more than 30 feet. In such cases, outlets shall be spaced not more than 30 feet apart, nor more than 15 feet from side walls.

6.3 No direct connections to sewers shall be permitted and all drains from the swimming pool to sewers shall be broken at a point where any sewage which may back up from the sewer will overflow to waste instead of reaching the pool.

6.4 Valves and/or pumps used for draining swimming pools shall be sized to prevent the surcharging of the sanitary sewer.

6.5 Inlets for fresh and/or repurified water shall be located to produce uniform circulation of water and to facilitate the maintenance of a uniform disinfectant residual throughout the entire swimming pool, without existence of dead spots. Inlets from the circulation system shall be flush with the pool wall and submerged at least 12 inches below the water level. Where water from the public water system is added to the pool, cross-connections between the public water system and the pool water shall be eliminated by pumping make-up

water from a pump suction well or admitting water to the pool by means of an air gap connection preferably located under a low diving board. (See Sec. 1.2)

6.6 Where the distance across the shallow portion of the swimming pool is more than 15 feet, multiple inlets must be provided, so spaced that each inlet will serve a linear distance of not more than 15 feet. In swimming pools with surface area greater than 1,600 square feet or length in excess of 60 feet, side inlets shall be placed at 15 feet intervals around the entire perimeter. In any case, an adequate number of inlets shall be provided, properly spaced and located to accomplish complete and uniform recirculation of water and maintenance of uniform disinfectant residual at all times.

6.7 Each inlet shall be designed as an orifice subject to adjustment or must be provided with an individual gate or similar valve to permit adjustment of water volume to obtain the best circulation.

Slope of Bottom

7.1 The slope of the bottom of any portion of the swimming pool having a water depth of less than five feet shall not be more than one foot in 12 feet and said slope shall be uniform. In portions with a depth greater than 5 feet, the slope shall not exceed 1 foot in 3 feet.

Side Walls

8.1 Walls of a swimming pool shall be either (a) vertical for water depths of at least six feet; or (b) vertical for a distance of three feet below the water level below which the wall may be curved to the bottom with a radius not greater than the difference between the depth at that point and three feet, provided that vertical is interpreted to permit slopes not greater than 1 foot horizontally for each 5 feet of depth of sidewall (11° from vertical).

8.2 Safety ledges when provided on vertical walls in the deep portion of the swimming pool shall be not over four inches

wide, at least four feet below the water surface, and shall slope one-half inch in four inches toward the pool.

Overflow Gutters

9.1 Overflow gutters shall be required on all swimming pools having a surface area of over 1,600 square feet. (Pools having a surface area of less than 1,600 square feet shall be povided either with overflow gutters or skimmers.)

9.2 Overflow gutters shall extend completely around the swimming pool, except at steps or recessed ladders. The overflow gutter shall also serve as a handhold. This gutter shall be capable of continuously removing 50% or more of the recirculated water and return it to the filter. All overflow gutters shall be connected to the recirculation system through a properly designed surge tank. The gutter, drains, and return piping to the surge tank shall be designed to rapidly remove overflow water caused by recirculation displacement, wave action, or other causes produced from the maximum pool bathing load. The opening into the gutter beneath the coping shall be not less than four inches and the interior of the gutter shall be not less than three inches wide with a depth of at least three inches. Where large gutters are used, they shall be designed to prevent entrance or entrapment of bathers' arms or legs. The overflow edge or lip shall be rounded and not thicker than 2½ inches for the top two inches. The overflow outlets shall be provided with outlet pipes which shall in any case be at least two inches in diameter. The outlet fittings shall have a clear opening in the grating at least equal to 1½ times the cross-sectional area of the outlet pipe.

9.3 Nothing in this section shall preclude the use of roll-out or deck level type swimming pools. Such designs shall conform to the general provisions relating to overflow rates. The design of the curb and handhold shall conform to accepted standards, and the approval of the Health Department shall be based on detailed review of this feature of construction and evaluated in the light of proposed use of the pool.

Skimmers*

10.1 Skimmers are permitted on public swimming pools with not more than 1,600 square feet of water surface area, providing approved handholds are installed and sufficient motion to the pool water is induced by the pressure return inlets. At least one skimming device shall be provided for each 500 square feet of water surface area or fraction thereof. Where two or more skimmers are required, they shall be so located as to minimize interference with each other and to insure proper skimming of the entire pool surface. Handholds shall consist of bull-nosed coping not over 2½ inches thick for the outer two inches or an equivalent approved handhold. The handholds must be no more than nine inches above the normal water line. Skimming devices shall be built into the pool wall, shall develop sufficient velocity on the pool water surface to induce floating oils and wastes into the skimmer from the water surface of the entire pool area, and shall meet the following general specifications:

(a) The piping and other pertinent components of skimmers shall be designed for a total capacity of at least 80% of the required filter flow of the recirculation system and no skimmer shall be designed for a flow-through rate of less than 30 gallons per minute or 3.75 gallons per minute per lineal inch of weir.

(b) The skimmer weir shall be automatically adjustable and shall operate freely with continuous action to variations in water level over a range of at least four inches. The weir shall operate at all flow variations as described in Section 10.11. The weir shall be of such buoyancy and design so as to develop an effective velocity.

(c) An easily removable and cleanable basket or screen through which all overflow water must pass shall be provided to trap large solids.

(d) The skimmer shall be provided with a device to prevent air-lock in the suction line. If an equalizer

* All skimmers shall comply in all respects with the standards of the National Sanitation Foundation covering skimmers.

pipe is used, it shall provide an adequate amount of water for pump suction should the water of the swimming pool drop below the weir level, provided that, if any other device, surge tank, or arrangement is used, a sufficient amount of water for pump suction shall be assured.

(e) Where the equalizer pipe is used, it shall be sized to meet the capacity requirements of the filter and pump and shall in no case be less than two inches in diameter. This pipe shall be located at least one foot below the lowest overflow level of the skimmer. It shall be provided with a valve or equivalent device that will remain tightly closed under normal operating conditions, but will automatically open when the water level drops as much as two inches below the lowest weir level.

(f) The skimmer shall be of sturdy, corrosion-resistant materials.

Recirculation Systems

11.1 A recirculation system, consisting of pumps, piping, filters, water conditioning, and disinfection equipment and other accessory equipment shall be provided which will clarify and disinfect the swimming pool volume of water in eight hours or less, thus providing a minimum turnover of at least three times in 24 hours except that the recirculation rate shall be increased to provide a six hour turnover for swimming pools subjected to heavy bather loads.

11.2 All piping shall be designed to reduce friction losses to a minimum and to carry the required quantity of water at a maximum velocity not to exceed six feet per second. Piping shall be of non-toxic material, resistant to corrosion, and able to withstand operating pressures. Pipes shall be identified by a color code or tags.

11.3 The recirculation system shall include a strainer to prevent hair, lint, etc. from reaching the pump and filters. Stariners shall be corrosion-resistant with openings not more than one-eighth inch in size providing a free flow area at least

four times the area of pump suction line and shall be readily accessible for frequent cleaning.

11.4 A vacuum-cleaning system shall be provided. When an integral part of the recirculation system, sufficient connections shall be located in the walls of the swimming pool, at least eight inches below the water line.

11.5 A rate-of-flow indicator, reading in gallons per minute, shall be installed and located, preferably on the swimming pool return line, so that the rate of recirculation and backwash rate will be indicated. The indicator shall be capable of flows measuring at least 1½ times the design flow rate, shall be accurate within 10% of true flow, and shall be easy to read.

11.6 Pumps shall be of adequate capacity to provide the required number of turnovers of swimming pool water as specified in Section 11.1, and whenever possible shall be so located as to eliminate need for priming. If the pump or suction piping is located above the overflow level of the pool, the pump shall be self-priming. The pump or pumps shall be capable of providing flow adequate for the backwashing of filters. Under normal conditions, the pump or pumps shall supply the recirculation rate of flow at a dynamic head of at least 50 feet for pressure sand type filters or at least 80 feet for pressure diatomaceous earth type filters.

11.7 Swimming pools equipped with heaters shall have a fixed thermometer in the recirculation line at the heater outlet and another near the outlet to the pool.

User Loading

12.1 For the purposes of computing user loading, those portions of the swimming pool five feet or less in depth shall be designated as "non-swimmer" areas. Portions of the pool over five feet in depth shall be designated as the "swimming" area.

12.2 In order to compute swimmer and bather capacity, swimming pool areas shall be determined as follows:

(a) Ten square feet of pool water surface area shall be provided for each non-swimmer expected at time of maximum load.

(b) Twenty-four square feet shall be provided for each swimmer expected at time of maximum load.

(c) Three hundred square feet of pool water surface area shall be reserved around each diving board or diving platform and this area shall not be included in computing the area of the swimming section.

12.3 The Health Department shall make additional allowance for bathers in cases of swimming pools with extensive deck areas used by patrons for lounging or sun-bathing. These allowances shall be based on studies of actual swimming pool use in areas within the jurisdiction of the Health Department.

Sand Type Filters*

13.1 The following requirements are equally applicable to either gravity or pressure sand type filters.

13.2 Pressure sand type filters shall be designed for a filter rate of 3 gallons per minute per square foot of bed area at time of maximum head loss with sufficient area to meet the design rate of flow required by the prescribed turnover.

13.3 Filtering material shall consist of at least 20 inches of screened, sharp filter sand with an effective size between 0.4 and 0.55 mm., and a uniformity coefficient not exceeding 1.75, supported by at least 10 inches of graded filter gravel. Anthracite having an effective size between 0.6 and 0.8 mm., with a uniformity coefficient of not greater than 1.8 may be used in lieu of the sand. The gravel shall effectively distribute water uniformly during filtration and backwashing. A reduction in this depth or an elimination of gravel may be permitted where equivalent performance and service are demonstrated.

13.4 The underdrain system shall be of corrosion resistant and enduring material, so designed and of such material that the orifices or other openings will maintain approximately constant area. It shall be designed to provide even collection or distribution of the flow during filtration and backwashing.

* All sand type filters, whether of the gravity or pressure type, shall comply in all respects with the standards of the National Sanitation Foundation covering such filters.

13.5 At least 12 inches of freeboard shall be provided between the upper surface of the filter media and the lowest portion of the pipes or drains which serve as overflows during backwashing.

13.6 The filter system shall be provided with influent and effluent pressure gauges, backwash sight glass on the waste discharge line and air-relief valves at or near the high point of the filter.

13.7 The filter system shall be designed with necessary valves and piping to permit:

(a) Filtering to swimming pool;

(b) Individual backwashing of filters to waste at a rate of not less than 15 gallons per minute per square foot of filter area;

(c) Isolation of individual filters for repairs while other units are in service;

(d) Complete drainage of all parts of the system;

(e) Necessary maintenance, operation and inspection in a convenient manner.

13.8 Each pressure type filter tank shall be provided with an access opening of not less than a standard 11-inch by 15-inch manhole and cover.

13.9 Devices with reasonably accurate dosage control features shall be provided for adding coagulants ahead of the filters.

13.10 On pressure type filters, the tank and its integral parts shall be constructed of substantial material capable of withstanding continuous anticipated usage and shall be designed for a pressure safety factor of 4 based on the maximum shutoff head of the pump. This shutoff head for design purposes shall in no case be considered less than 50 pounds per square inch.

Diatomaceous Earth Type Filters*

14.1 Sufficient filtering area shall be provided to meet the design pump capacity as required by Section 11.1.

* All diatomaceous earth type filters, whether of the vacuum or pressure type, shall comply in all respects with the standards of the National Sanitation Foundation covering such filters.

14.2 Rate of Filtration: The design rate of filtration shall not be greater than 2.0 gpm/sq.ft. of effective filtering surface without continuous body feed, and not greater than 2.5 gpm/sq.ft. with continuous body feed.

14.3 Where body feed is provided, the device shall be accurate (10%) and dependable, and shall be capable of continually feeding within a calibrated range, adjustable from 2 to 6 ppm, at the design capacity of the recirculation pump.

14.4 Filtering area, where fabric is used, shall be determined on the basis of effective filtering surfaces as created by the septum supports with no allowances for areas of impaired filtration, such as broad supports, folds or portions which may bridge.

14.5 The filter and all component parts shall be of such materials, design and construction to withstand normal continuous use without significant deformation, deterioration, corrosion or wear which could adversely effect filter operation.

14.6 The filter shall be so designed and constructed, or provision made, to preclude the introduction of appreciable quantities of filter-aid into the pool during precoating operations.

14.7 The tank containing the filter elements shall be constructed of steel, plastic, or other suitable material, which will satisfactorily provide resistance to corrosion, with or without coating. Pressure type filters shall be designed for a minimum working pressure of 50 lbs. per square inch with a four to one safety factor. Vacuum type filters shall be designed to withstand the pressure developed by the weight of the water contained therein and closed vacuum type filters shall, in addition, be designed to withstand the crushing pressure developed under a vacuum of 25 inches of mercury with a safety factor of 1.5 in both instances. The septa or elements which support the filter-aid shall be of corrosion-resistant material. The septa shall be constructed to be resistant to rupture under conditions of the maximum differential pressure between influent and effluent which can be developed by the circulating pump and of adequate strength to resist any additional stresses developed by the cleaning operation.

14.8 Where dissimilar metals, which may set up galvanic electric currents, are used in the filters, provision shall be made to resist electrolytic corrosion. The filters shall be designed in such a manner that they may be easily disassembled with allowances made for adequate working space above and around the filter to allow the removal and replacement of any part and for proper maintenance.

14.9 The filter plant shall be provided with such pressure, vacuum or compound gauges as are required to indicate the condition of the filter. In vacuum type filter installations where the circulating pump is two horsepower or higher, an adjustable high vacuum automatic shut-off shall be provided to prevent damage to the pump by cavitation.

14.10 All filters shall be equipped for cleaning by one or more of the following methods: back-washing, air-bump-assist back-washing, spray wash (mechanical or manual), or agitation.

14.11 Provision shall be made for completely and rapidly draining the filter.

Ladders, Recessed Treads, and Stairs

15.1 Steps or ladders shall be provided at the shallow end of the swimming pool if the vertical distance from the bottom of the pool to the deck or walk is over two feet. Recessed steps or ladders shall be provided at the deep portion of the swimming pool, and, if the pool is over 30 feet wide, such steps or ladders shall be installed on each side.

15.2 Steps leading into the swimming pool shall be of non-slip design, have a minimum tread of 12 inches and a maximum rise or height of 10 inches. There shall be no abrupt drop off or submerged projections into the pool, unless guarded by handrails.

15.3 Swimming pool ladders shall be corrosion-resistant and shall be equipped with non-slip treads. All ladders shall be so designed as to provide a handhold and shall be rigidly installed. There shall be a clearance of not more than five inches nor less than three inches between any ladder and the pool wall. If steps are inserted in the walls or if stepholes are provided, they shall be of such design that they may be

cleaned readily and shall be arranged to drain into the pool to prevent the accumulation of dirt thereon. Stepholes shall have a minimum tread of five inches and a minimum width of 14 inches.

15.4 Where steps, stepholes, or ladders are provided within the swimming pool, there shall be a handrail at the top of both sides thereof, extending over the coping or edge of the deck.

15.5 Supports, platforms, and steps for diving boards shall be of substantial construction and of sufficient structural strength to safely carry the maximum anticipated loads. Steps shall be of corrosion-resistant material, easily cleanable, and of non-slip design. Handrails shall be provided at all steps and ladders leading to diving boards more than one meter above the water, except those set at 15° or more from the vertical. Platforms and diving boards which are over one meter high shall be protected with guard railings.

Decks and Walkways

16.1 A continuous deck at lease five feet (and preferably eight or more feet) wide shall extend completely around the swimming pool. The deck shall be sloped away from the pool to drain at a grade of ¼ inch to ⅜ inch per lineal foot and shall have a non-slip surface. Deck drains connected to the recirculation system or gutters shall be permitted only with specific permission of the Health Officer.

Diving Areas

17.1 The dimensions of the swimming pool in the diving area shall conform to the following table.

Height of Board Meters	*Minimum Water Depth at End of Board and 12 Feet Beyond*	*Minimum Pool Width at End of Board and 12 Feet Beyond*
0.0-2.0	8½ ft.	20 ft.
2.1-3.0	10 ft.	30 ft.
3.1 or more	11½ ft.	30 ft.

17.2 At least 15 feet free and unobstructed head room shall be provided above diving boards.

17.3 Horizontal separation of 10 feet shall be provided between diving boards and side walls except this may be reduced to 8 feet for surface boards.

Disinfectant and Chemical Feeders

18.1 The swimming pool shall be equipped with a chlorinator, hypochlorinator, or other disinfectant feeder or feeders which meet the following requirements:

18.11 Shall be of sturdy construction and materials which will withstand wear, corrosion, or attack by disinfectant solutions or vapors and which are not adversely affected by repeated regular adjustments or other conditions anticipated in the use of the device. The feeder shall be capable of being easily disassembled for cleaning and maintenance. The design and construction shall be such as to preclude stoppage from chemicals intended to be used or foreign materials that may be contained therein. The feeder shall incorporate failure-proof features so that the disinfectant cannot feed directly into the swimming pool, the pool piping system, water supply system, or the swimming pool enclosure under any type of failure of the equipment or its maintenance.

18.12 Shall be capable of supplying at least the equivalent of one pound of chlorine per eight hours for each 10,000 gallons of swimming pool capacity under conditions of operation to be anticipated at the proposed installation. This requirement may be reduced for special purpose swimming pools.

18.13 Shall have a graduated and clearly marked dosage adjustment to provide flows from full capacity to 25% of such capacity. The device shall be capable of continuous delivery within 10% of the dosage at any setting.

18.14 When the disinfectant is introduced at the suction

side of the pump, a device or method shall be provided to prevent air lock of the pump or recirculation system.

18.15 When compressed chlorine gas is used, the following additional features shall be provided:

(a) The chlorine and chlorinating equipment shall be in a separte well-ventilated room. Such rooms shall not be below ground level and shall be provided with vents near the floor which terminate out-of-doors. The door of the room shall not open to the swimming pool, and shall open to the outside.

(b) The chlorinator equipment shall be of rugged design, capable of withstanding wear without developing leaks.

(c) Chlorine cylinders shall be anchored to prevent their falling over. A valve stem wrench shall be maintained on the chlorine cylinder so the supply can be shut off quickly in the case of an emergency. Valve protection hood shall be kept in place except when the cylinder is connected.

(d) The chlorine feeding device shall be designed so that during accidents or interruptions of the water supply, leaking chlorine gas will be conducted to the out-of-doors.

(e) The chlorinator shall be a solution feed type, capable of delivering chlorine at its maximum rate without releasing chlorine gas to the atmosphere.

(f) The chlorinators shall be designed to prevent the backflow of water into the chlorine solution container.

(g) A gas mask designed for use in a chlorine atmosphere and of a type approved by the U. S. Bureau of Mines shall be provided. In addition, replacement canisters shall be provided and a record shall be kept of gas mask usage to insure that the mask will be serviceable when needed.

(h) The gas mask shall be kept in a closed cabinet, accessible without a key, located outside of the room in which the chlorinator is maintained.

(i) Installation of chlorinator equipment, and operation thereof, shall be carried on by and under the supervision of personnel experienced with installation and operation of such equipment.

18.16 When a hypochlorite solution is used to be fed through hypochlorinator equipment, such equipment shall also provide the following additional features:

(a) Feed shall be positive under all conditions of pressure in the circulating system, and without artificial constriction of the pump suction line whether this line is under vacuum or pressure head.

(b) Regulation shall be provided to insure constant feed with varying supply or back pressure.

(c) Positive features to prevent back-flow from recirculation system to the solution container, and provision for reducing to a minimum the entry into swimming pool of free calcium released from calcium hypochlorite.

(d) Provision to prevent siphoning of hypochlorite solution when the recirculation pump and hypochlorinator are both turned off. (This applies to above swimming pool level installations only.)

18.2 Equipment and piping used to apply chemicals to the water shall be of such size, design, and material that they may be cleaned and will be free from clogging, preferably of the positive displacement type. All material used for such equipment and piping shall be resistant to action of chemicals to be used therein.

Lighting, Ventilation, and Electrical Requirements

19.1 Where underwater lighting is used, not less than 0.5 watts shall be employed per square foot of swimming pool water surface area. Such lights shall be spaced to provide illumination so that all portions of the pool, including the bottom, may be readily seen without glare.

19.2 Area lighting shall provide at least 0.6 watts per square foot of deck area. If such lighting is used for night swimming, area and swimming pool lighting combined shall provide at least two watts per square foot of pool area with two-foot candles of illumination.

19.3 All electrical wiring shall conform with the National Electrical Code of the National Underwriters Laboratory and the ..... (agency having jurisdiction).

19.4 Each underwater light shall be individually grounded by means of a screwed or bolted connection to the metal junction box from which the branch circuit to the individual light proceeds. Such junction boxes shall not be located in the swimming pool deck.

19.5 No overhead electrical wiring shall pass within 20 feet of the swimming pool enclosure.

19.6 All indoor swimming pools, bathhouses, dressing rooms, shower rooms, and toilet spaces shall be adequately ventilated either by natural or mechanical means.

Dressing Rooms

20.1 Bathhouses to be used simultaneously by both sexes shall be divided into two parts separated by a tight partition, each designated for men or women. The entranees and exits shall be screened to break line of sight.

20.2 Floors of bathhouse shall be of smooth finished material with nonslip surface, impervious to moisture, and sloped to a drain. Junctions between walls and floors shall be coved.

20.3 Walls and partitions shall be of smooth, impervious material, free from cracks or open joints. Partitions between dressing rooms shall terminate at least 10 inches above the floor or shall be placed on continuous raised masonry or concrete bases at least four inches high. Lockers shall be set either on solid masonry bases four inches high or on legs with bottom of locker at least 10 inches above the floor. Lockers shall be properly vented.

20.4 The requirement relating to bathhouse, dressing rooms, toilet facilities and showers may be waived when such facilities are conveniently available to swimming pool patrons.

Toilets and Showers

21.1 Toilet and shower facilities shall be provided on the basis of the following fixture schedule*:

	Males	*Females*
Water Closets	1/75	1/50
Urinals	1/75	—
Lavatories	1/100	1/100
Showers**	1/50	1/50

Drinking Fountain—minimum of one to be located in swimming pool area

21.2 The layout of the bathhouse shall be such that the bathers on leaving the dressing room pass the toilets and showers en route to the swimming pool.

21.3 Showers shall be supplied with water at a temperature of at least 90° F. at a rate of at least three gallons per minute. Thermostatic, tempering, or mixing valves shall be installed if necessary to prevent scalding of the bathers.

Visitor and Spectator Areas

22.1 There shall be absolute separation between the spaces used by visitors and spectators from spaces used by bathers.

22.2 No food or drink shall be permitted in the immediate area of the swimming pool or on the decks surrounding the pool.

Safety Requirements — Lifesaving Equipment

23.1 Swimming pools operated primarily for unorganized use and having an area of more than 2,250 square feet of water surface area shall be provided with an elevated lifeguard platform or chair. In pools with 4,000 square feet or more of water surface area, additional elevated chairs or stations shall be provided, located so as to provide a clear unob-

* Fixture schedules should be increased for swimming pools at schools or similar locations where bather loads may reach peaks due to schedules of use.

** Minimum of two.

structed view of the pool bottom in the area under surveillance.

23.2 One unit of lifesaving equipment shall consist of the following: A ring buoy not more than 15 inches in diameter to which shall be attached a 60 foot length of three-sixteenth inch manila rope; a life pole or shepherd's crook type of pole having blunted ends with minimum length of 12 feet; a separate throwing line of one-quarter inch rope with length not less than 1½ times the maximum width of pool. Not less than one unit of equipment, as above, shall be provided at every public swimming pool. One unit shall be presumed to be adequate for 2,000 square feet of water surface area, and one additional unit shall be provided for each additional 2,000 square feet, or major fraction thereof, of water surface area.

23.3 Every swimming pool shall be equipped with a standard 24-unit first aid kit which shall be kept filled and ready for use.

23.4 Lifesaving equipment shall be mounted in conspicuous places, distributed around swimming pool deck, at lifeguard chairs, or elsewhere, readily accessible, its function plainly marked, and kept in repair and ready condition. Bathers or others shall not be permitted to tamper with, use for any purpose other than its intended use, or remove such equipment from its established location.

23.5 Where no lifeguard service is provided, a warning sign shall be placed in plain view and shall state "Warning—No Lifeguard on Duty" with clearly legible letters, at least four inches high. In addition, the sign shall also state "Children Should Not Use Pool Without An Adult in Attendance."

23.6 Every swimming pool shall have a readily accessible room or area designated and equipped for emergency care.

Disinfection and Quality of Water

24.1 Swimming pools when in use shall be continuously disinfected by a chemical which imparts an easily measured, free available residual effect. When chlorine is used, a free chlorine residual of at least 0.4 ppm shall be maintained through-

out the pool whenever it is open or in use. If other halogens are used, residuals of equivalent disinfecting strength shall be maintained. A testing kit for measuring the concentration of the disinfectant, accurate within 0.1 ppm, shall be provided at each swimming pool.

24.2 The Health Officer may accept other disinfecting materials or methods when they have been adequately demonstrated to provide a satisfactory residual effect which is easily measured and to otherwise be equally as effective under conditions of use as the chlorine concentration required herein, and not be dangerous to public health, create objectionable physiological effects, or impart toxic properties to the water.

24.3 The swimming pool water shall be maintained in an alkaline condition as indicated by a pH of not less than 7.2 and not over 8.2. A pH testing kit accurate to the nearest 0.2 pH unit shall be provided at each swimming pool. The alkalinity of the water shall be at least 50 ppm. as measured by the methylorange test.

24.4 The water shall have sufficient clarity at all times so that a black disc, six inches in diameter, is readily visible when placed on a white field at the deepest point of the swimming pool. Failure to meet this requirement shall constitute grounds for immediate closing of the pool.

24.5 Not more than 15% of the samples covering any considerable period of time shall either (a) contain more than 200 bacteria per milliliter, as determined by the standard (35°C) agar plate count, or (b) show positive test (confirmed test) for coliform organisms in any of the five 10-milliliter portions of a sample or more than 1.0 coliform organisms per 50ml. when the membrane filter test is used. All samples shall be collected, dechlorinated, and examined in accordance with the procedures outlined in the latest edition of *Standard Methods for the Examination of Water and Wastewater* (APHA). The Health Department shall arrange for the collection and examination of samples on a routine basis when the swimming pool is in active use.

24.6 Chemicals used in controlling the quality of water shall be demonstrated as imparting no toxic properties to the water.

Such chemicals as may be used for algae control shall be approved for use by the Health Department.

Cleaning Swimming Pools

25.1 Visible dirt on the bottom of the swimming pool shall be removed every 24 hours or more frequently as required.

25.2 Visible scum or floating matter on the swimming pool surface shall be removed within 24 hours by flushing or other effective means.

Supervision of Swimming Pools

26.1 Every swimming pool shall be operated under the close supervision of a trained operator. The Health Officer may require a certificate of competency obtained through attendance and successful completion of a swimming pool operator's training course as evidence of compliance with this Section.

26.2 Proper operating records, which may include the following as required by the Health Officer, shall be kept daily showing:

(a) Bather loads—total;
(b) Peak bather load;
(c) Volume fresh water added;
(d) Operating periods of recirculation pumps and filters and corresponding rate of flow meter readings;
(e) Amounts of chemicals used;
(f) Disinfectant residuals;
(g) pH readings;
(h) Maintenance (and malfunctioning) of equipment.

Supervision of Bathers

27.1 A qualified attendant, trained in first aid and resuscitation, shall be on duty at all times when the swimming pool is open to use by bathers except as provided in Section 23.5. Such attendant should be in full charge of bathing and have authority to enforce all rules of safety and sanitation.

27.2 The following personal regulations shall be enforced:

(a) All persons using the swimming pool shall take a cleansing shower bath in the nude, using warm water and soap, and thoroughly rinsing off all soap suds, before entering the swimming pool room or enclosure. A bather leaving the pool to use the toilet shall take a second cleansing bath before returning to the swimming pool room or enclosure.

(b) Any person having an infectious or communicable disease shall be excluded from a public swimming pool. Persons having any considerable area of exposed subepidermal tissue, open blisters, cuts, etc., shall be warned that these are likely to become infected and advised not to use the pool.

(c) Spitting, spouting of water, blowing the nose, etc., in the swimming pool shall be strictly prohibited.

(d) No running, boisterous or rough play, except supervised water sports, shall be permitted in the pool, on the runways, diving boards, floats, platforms or in dressing rooms, shower rooms, etc.

(e) Suitable placards embodying the above personal regulations and instructions and those relating to suits and towels shall be conspicuously posted in the swimming pool room or enclosure and in the dressing rooms and offices at all swimming pools.